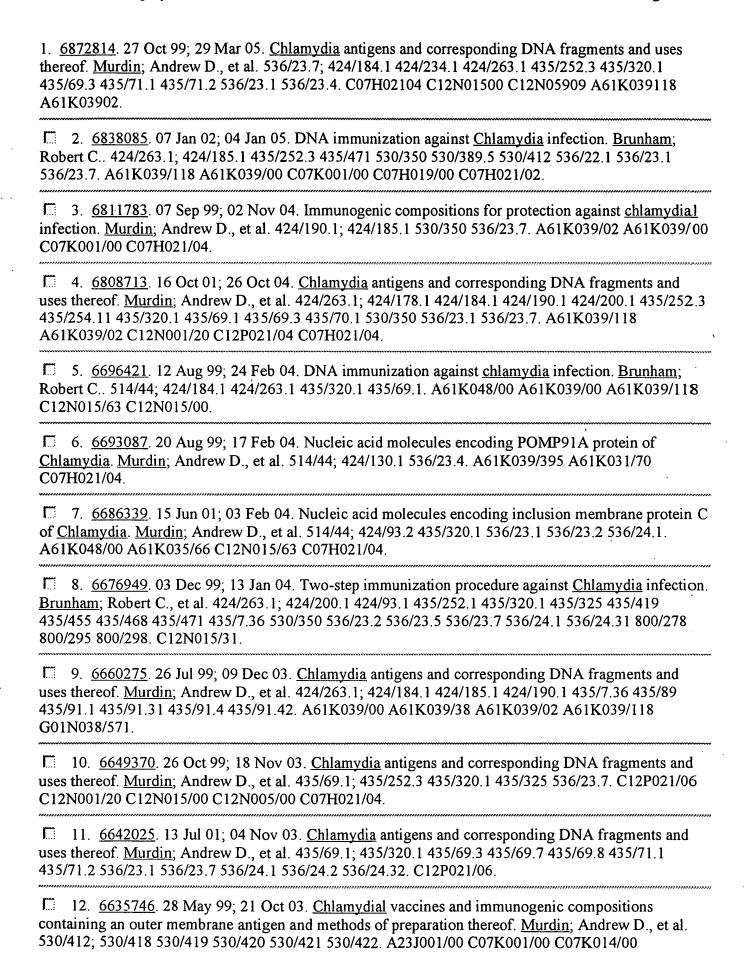
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DATE: Monday, May 02, 2005

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	L2	L1 and salmone\$.ti,ab,clm.	360
· <b>C</b>	L3	L2 and (mammal\$ or animal\$ or eukaryote or eukaryotic or eucaryote or eucaryotic or cho or human or fibroblast).ti,ab,clm.	253
	L4	(momp or mompa or momp-a or (membrane near2 protein)).ti,ab,clm.	4958
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	L7	11 and 14	194
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	L9	(brunham or murdin).in.	139
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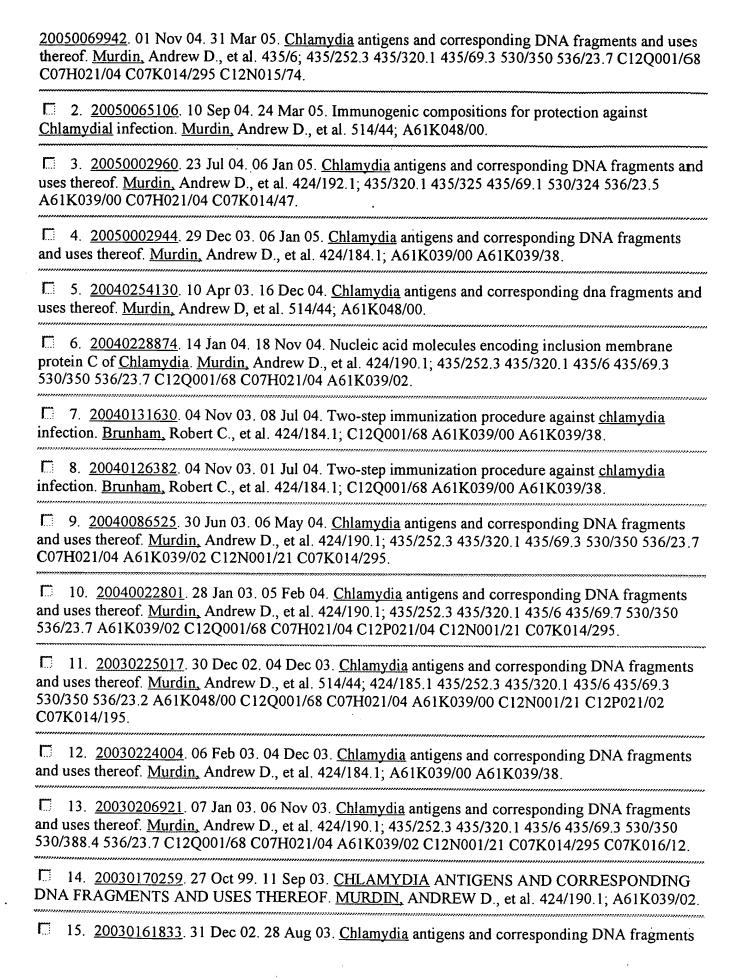


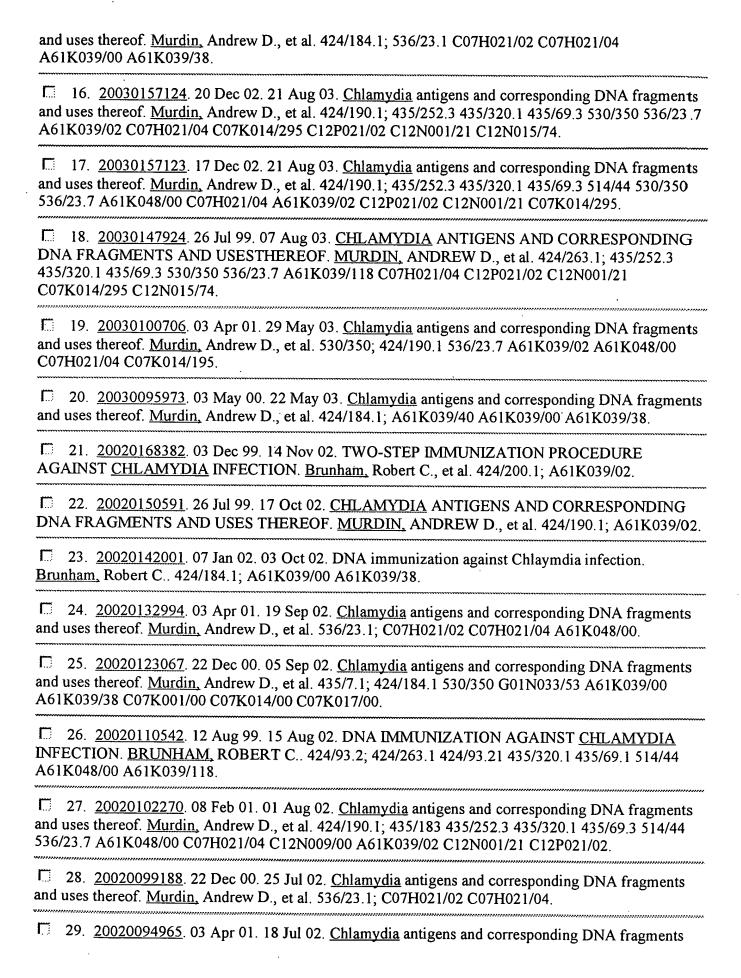
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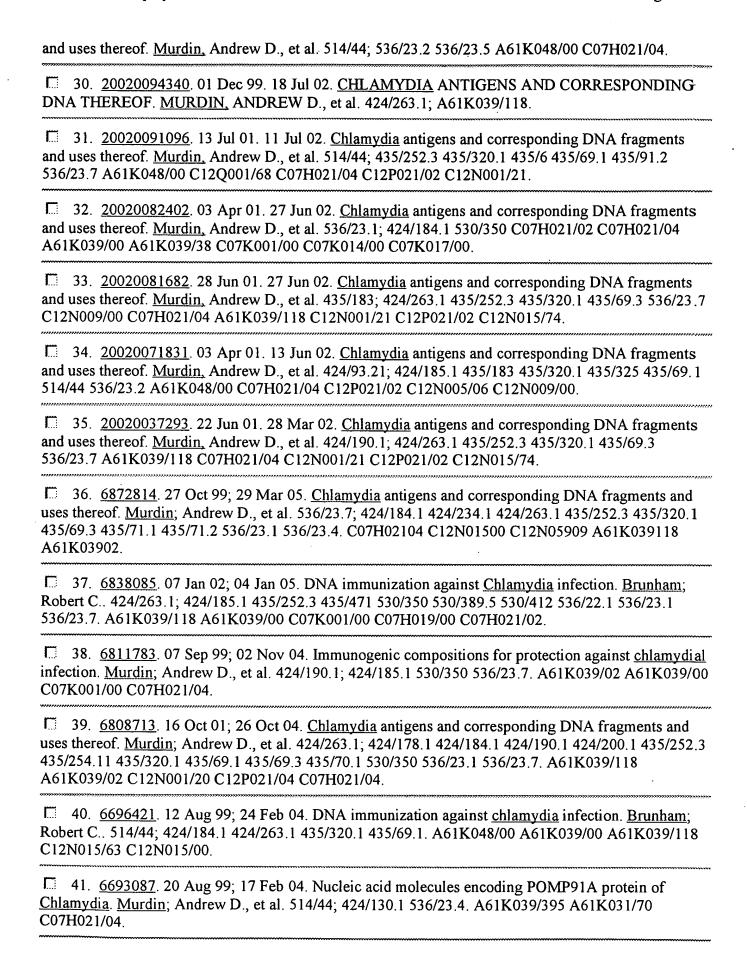
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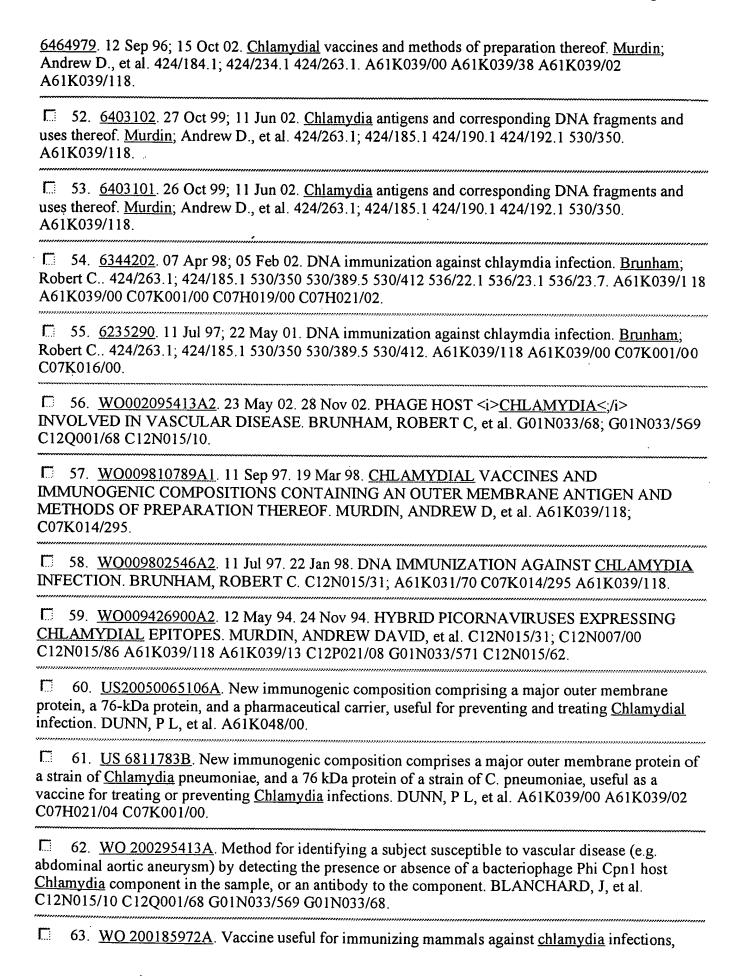


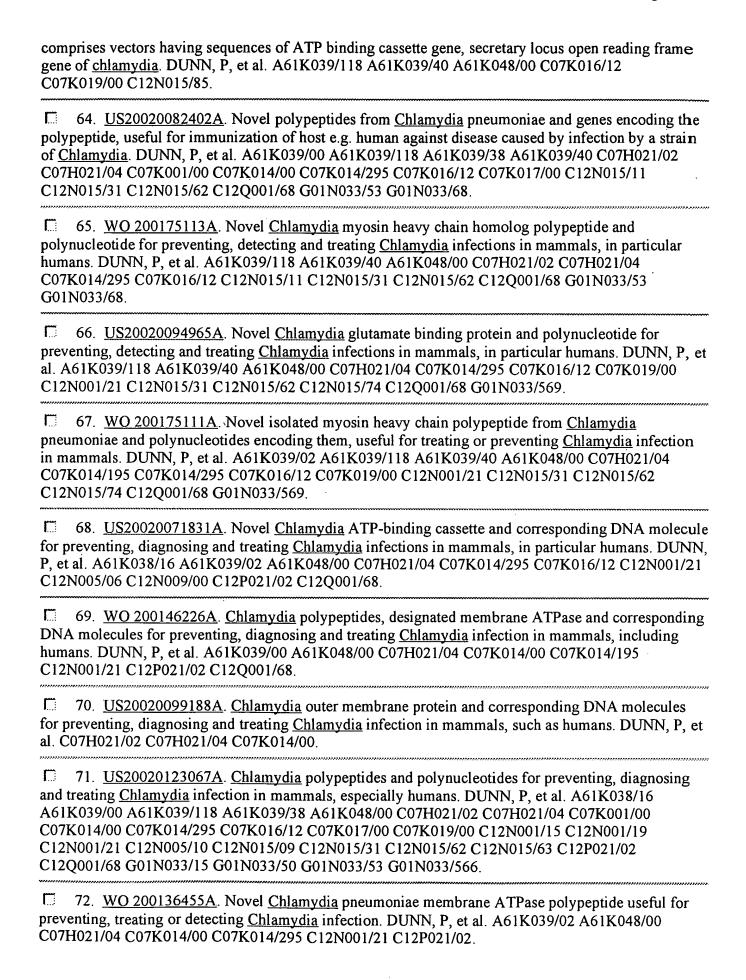


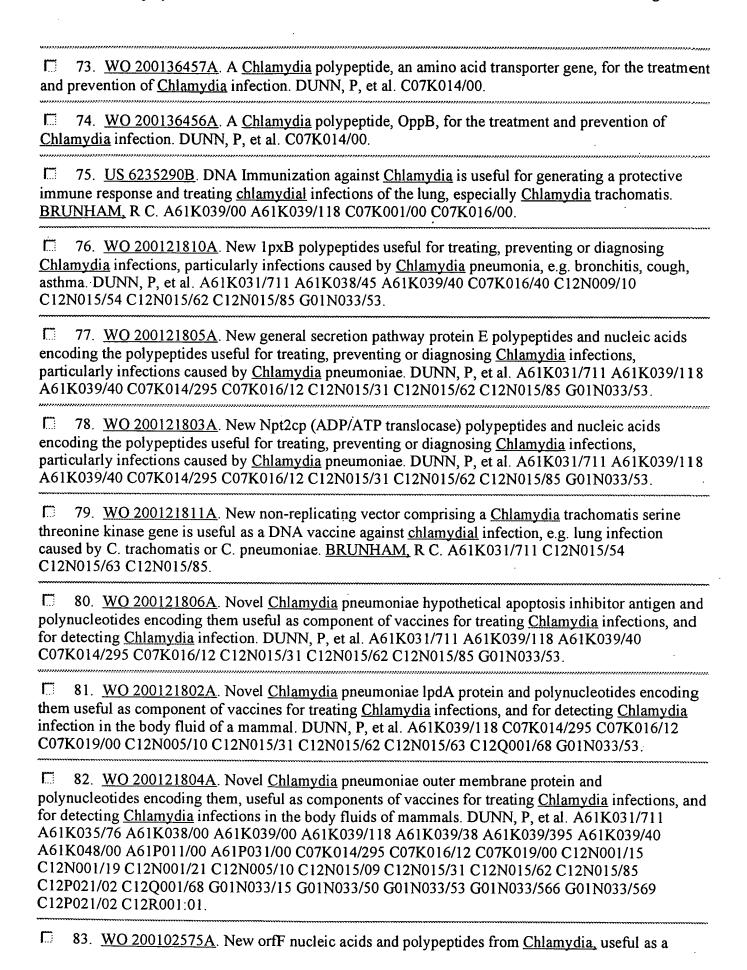
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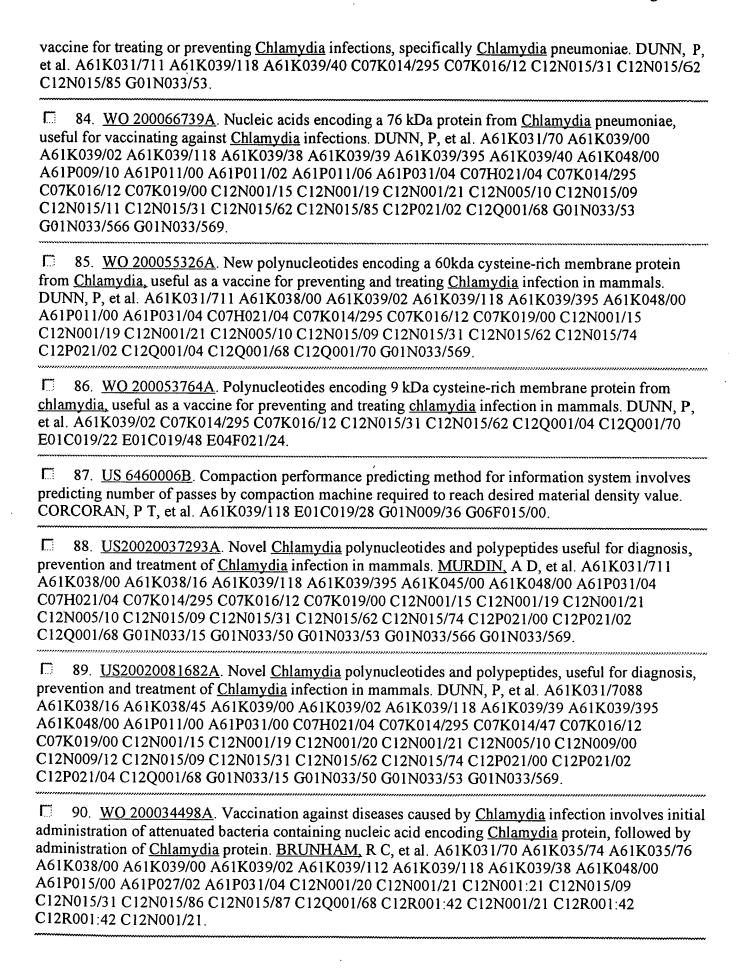
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L9 and chlamyd\$	109

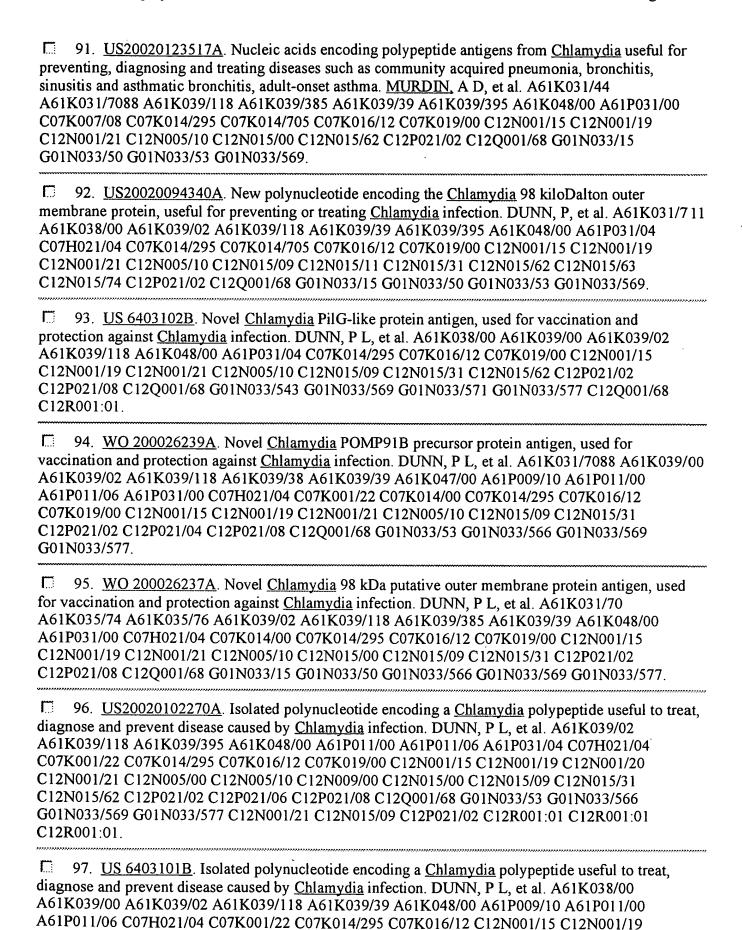
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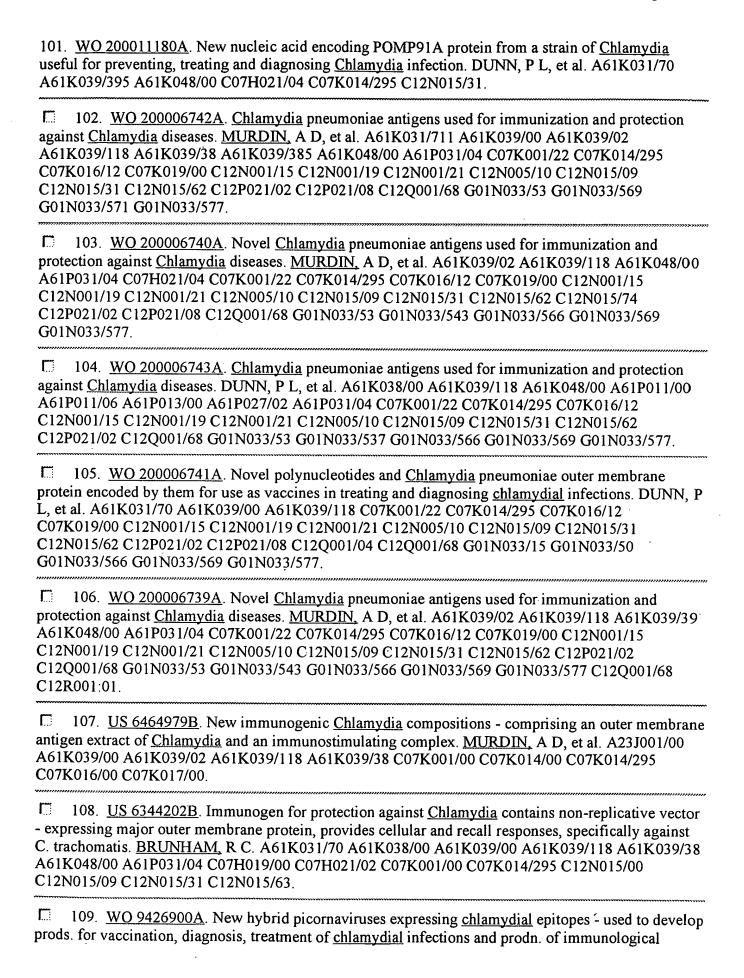
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US-PAT-NO: 6838085

DOCUMENT-IDENTIFIER: US 6838085 B2

TITLE: DNA immunization against Chlamydia infection

DATE-ISSUED: January 4, 2005

INVENTOR-INFORMATION:

**NAME** CITY STATE ZIP CODE COUNTRY

Brunham; Robert C. Winnipeg CA

US-CL-CURRENT: 424/263.1; 424/185.1, 435/252.3, 435/471, 530/350, 530/389.5, 530/412, 536/22.1, 536/23.1, 536/23.7

### CLAIMS:

#### What I claim is:

- 1. A non-replicating vector, comprising: a nucleotide sequence encoding a region comprising at least one of the conserved domains 2, 3 and 5 of a major outer membrane protein of a strain of Chlamydia, and a promoter sequence operatively coupled to said nucleotide sequence for expression of said at least one conserved domain in a host.
- 2. The vector of claim 1 wherein said nucleotide sequence encoding the conserved domain 2 and/or 3 further includes a nucleotide sequence encoding a variable domain of the major outer membrane protein immediately downstream of the conserved domain.
- 3. The vector of claim 1 wherein said nucleotide sequence encodes the conserved domain 5 of the outer membrane protein.
- 4. The vector of claim 1 wherein said promoter sequence is the cytomegalovirus promoter.
- 5. The vector of claim 1 wherein said non-replicating vector comprises plasmid pcDNA3 containing said promoter sequence and into wherein said nucleotide sequence is inserted in operative position to said promoter sequence.
- 6. The vector of claim 5 wherein said strain of Chlamydia is a strain producing chlamydial infectious of the lung.
- 7. The vector of claim 5 wherein said strain of Chlamydia is a strain of Chlamydia trachomatis.

US-PAT-NO: 6696421

DOCUMENT-IDENTIFIER: US 6696421 B2

TITLE: DNA immunization against chlamydia infection

DATE-ISSUED: February 24, 2004

**INVENTOR-INFORMATION:** 

NAME CITY STATE ZIP CODE COUNTRY

Brunham; Robert C. Winnipeg CA

US-CL-CURRENT: <u>514/44</u>; <u>424/184.1</u>, <u>424/263.1</u>, <u>435/320.1</u>, <u>435/69.1</u>

#### CLAIMS:

#### I claim:

- 1. An immunogenic composition for intranasal or intramuscular administration to a host for the generation in the host of a protective immune response to a major outer membrane protein (MOMP) of a strain of Chlamydia trachornatis or Chlamydia pneumoniae, comprising a non-replicating vector suitable for DNA vaccine use, comprising: a nucleotide sequence encoding said MOMP or an N-terminal fragment of approximately half full-length MOMP, and a cyomegalovirus promoter sequence operatively coupled to said nucleotide sequence for expression of said MOMP in the host; and a pharmaceutically-acceptable carrier therefor.
- 2. The immunogenic composition of claim 1 wherein said nucleotide sequence encodes full-length  $\underline{\mathsf{MOMP}}$ .
- 3. The immunogenic composition of claim 1 wherein said strain of  $\frac{Chlamydia}{Chlamydia}$  is a strain of  $\frac{Chlamydia}{Chlamydia}$  trachomatis.
- 4. The immunogenic composition of claim 3 wherein said non-replicating vector comprises plasmid pcDNA3 containing said promoter sequence and into which said nucleotide sequence is inserted in operative relation to said promoter sequence.
- 5. The immunogenic composition of claim 1 wherein said immune response is predominantly a cellular immune response.
- 6. The immunogenic composition of claim 1 wherein said nucleotide sequence encodes said MOMP which stimulates a recall immune response following exposure to wild-type Chlamydia.
- 7. A method of immunizing a host against disease caused by infection with a strain of <u>Chlamydia</u> trachomatis or <u>Chlamydia</u> pneunioniae, which comprises administering to said host intranasally or intramuscularly an effective amount of a non-replicating vector comprising: a nucleotide sequence encoding a major outer <u>membrane protein (MOMP)</u> of a strain of <u>Chlamydia</u> trachomatis or <u>Chlamydia</u> pneumoniae or an N-terminal fragment of approximately half the fulllength <u>MOMP</u>, and a promoter sequence operatively coupled to said nucleotide sequence for expression of said <u>MOMP</u> in the host.

- $8.\$ The method of claim 7 wherein said nucleotide sequence encodes full-length MOMP.
- 9. The method of claim 7 wherein said nucleotide sequence encodes an N-terminal fragment of approximately half of full length MOMP.
- 10. The method of claim 7 wherein said promoter sequence is a cytomegalovirus promoter.
- 11. The method of claim 7 wherein said strain of  $\underline{\text{Chlamydia}}$  is a strain of  $\underline{\text{Chlamydia}}$  trachomatis.
- 12. The method of claim 7 wherein said non-replicating vector comprises plasmid pcDNA3 containing said promoter into which said nucleotide sequence is inserted in operative relation to said promoter sequence.
- 13. The method of claim 7 wherein said immune response is predominantly a cellular immune response.
- 14. The method of claim 7 wherein said nucleotide sequence encodes said MOMP which stimulates a recall immune response following exposure to wild-type Chlamydia.
- 15. The method of claim 7 wherein said non-replicating vector is administered intranasally.
- 16. A method of using a gene encoding a major outer <u>membrane protein (MOMP)</u> of a strain of <u>Chlamydia</u> trachomatis or Chlamycha pneumoniae or an N-terminal fragment of approximately half of the full-length <u>MOMP</u>, which comprises: isolating said gene, operatively linking said gene to at least one control sequence to produce a non-replicating vector, said control sequence directing expression of said <u>MOMP</u> or fragment thereof when introduced into a host to produce an immune response to said <u>MOMP</u> or fragment thereof, and introducing said vector into a host intranasally or intramuscularly.
- 17. The method of claim 16 wherein said gene encoding  $\underline{MOMP}$  encodes full length  $\underline{MOMP}$ .
- 18. The method of claim 16 wherein said gene encoding MOMP encodes an N-terminal fragment of approximately half of full-length MOMP.
- 19. The method of claim 16 wherein said control sequence is a cytomegalovirus promoter.
- 20. The method of claim 16 wherein said strain of <a href="Chlamydia">Chlamydia</a> trachomatis.
- 21. The method of claim 16 wherein said non-replicating vector comprises plasmid pcDNA3 containing said control sequence into which said gene encoding  $\underline{\text{MOMP}}$  is inserted in operative relation to said control sequence.
- 22. The method of claim 16 wherein said immune response is predominantly a cellular immune response.
- 23. The method of claim 16 wherein said gene encodes said MOMP which

stimulates a recall immune response following exposure to wild-type <a href="Chlamydia">Chlamydia</a>.

24. The method of claim 16 wherein said vector is introduced into said host intranasally.

L8: Entry 32 of 99

File: USPT

Feb 3, 2004

US-PAT-NO: 6686339

DOCUMENT-IDENTIFIER: US 6686339 B1

TITLE: Nucleic acid molecules encoding inclusion membrane protein C of Chlamydia

DATE-ISSUED: February 3, 2004

**INVENTOR-INFORMATION:** 

NAME CITY STATE ZIP CODE COUNTRY

Murdin; Andrew D. Newmarket CA
Dunn; Pamela L. Mississauga CA
Oomen; Raymond P. Schomberg CA

US-CL-CURRENT: 514/44; 424/93.2, 435/320.1, 536/23.1, 536/23.2, 536/24.1

#### CLAIMS:

What we claim is:

- 1. An expression cassette comprising an isolated nucleic acid molecule placed under the control of elements required for expression of said nucleic acid molecule, said isolated nucleic acid molecule comprising a polynucleotide sequence encoding an amino acid sequence selected from the group consisting of: (a) an amino acid sequence as set forth in SEQ ID NO: 3; and (b) a fragment of the sequence in (a), said fragment comprising at least 12 amino acids and being capable of inducing an immune response against Chlamydia.
- 2. The expression cassette according to claim 1 wherein, in (b), said fragment comprises at least 20 amino acids.
- 3. The expression cassette according to claim 1 wherein, in (b), said fragment comprises at least 50 amino acids.
- 4. The expression cassette according to claim 1 wherein, in (b), said fragment comprises at least 75 amino acids.
- 5. The expression cassette according to claim 1 wherein, in (b), said fragment comprises at least 100 amino acids.
- 6. The expression cassette according to claim 1 wherein, in (b), said amino acid sequence retains the specific antigenicity of SEQ ID NO: 3.
- 7. The expression cassette according to claim 1, said nucleic acid molecule comprising a polynucleotide sequence encoding the amino acid sequence as set forth in SEQ ID NO: 3.
- 8. The expression cassette according to claim 1, wherein said polynucleotide sequence comprises the sequence set forth in SEQ ID NO: 1 or 2.
- 9. An expression vector comprising the expression cassette of claim 1.

- 10. A vaccine vector comprising an isolated nucleic acid molecule placed under the control of elements required for expression of said isolated nucleic acid molecule, said nucleic acid molecule comprising a polynucleotide sequence encoding an amino acid sequence selected from the group consisting of: (a) an amino acid sequence as set forth in SEQ ID NO: 3; and (b) a fragment of the sequence in (a), said fragment comprising at least 12 amino acids and being capable of inducing an immune response against Chlamydia.
- 11. The vaccine vector according to claim 10 wherein, in (b), said fragment comprises at least 20 amino acids.
- 12. The vaccine vector according to claim 10 wherein, in (b), said fragment comprises at least 50 amino acids.
- 13. The vaccine vector according to claim 10 wherein, in (b), said fragment comprises at least 75 amino acids.
- 14. The vaccine vector according to claim 10 wherein, in (b), said fragment comprises at least 100 amino acids.
- 15. The vaccine vector according to claim 10 wherein, in (b), said amino acid sequence retains the specific antigenicity of SEQ ID NO: 3.
- 16. The vaccine vector according to claim 10, said nucleic acid molecule comprising a polynucleotide sequence encoding the amino acid sequence as set forth in SEQ ID NO: 3.
- 17. The vaccine vector according to claim 10, wherein said polynucleotide sequence comprises the sequence set forth in SEQ ID NO: 1 or 2.
- 18. The vaccine vector according to claim 10 wherein the elements required for expression include a promoter.
- 19. The vaccine vector according to claim 18 wherein the promoter is a cytomegalovirus promoter.
- 20. The vaccine vector according to claim 19, which is a plasmid vector.
- 21. The vaccine vector of claim 20 wherein said plasmid vector has the identifying characteristics of plasmid pCAI115, as shown in FIG. 3.
- 22. An imunogenic composition comprising an isolated nucleic acid molecule comprising a polynucleotide sequence encoding an amino acid sequence selected from the group consisting of: (a) an amino acid sequence as set forth in SEQ ID NO: 3; and (b) a fragment of the sequence in (a), said fragment comprising at least 12 amino acids and being capable of inducing an immune response against <a href="Chlamydia">Chlamydia</a>.
- 23. An immunogenic composition comprising a vaccine vector according to claim 10.
- 24. An immunogenic composition comprising a vaccine vector according to claim 11.
- 25. An immunogenic composition comprising a vaccine vector according to claim

12.

- 26. An immunogenic composition comprising a vaccine vector according to claim
- 27. An immunogenic composition comprising a vaccine vector according to claim
- 28. An immunogenic composition comprising a vaccine vector according to claim
- 29. An immunogenic composition comprising a vaccine vector according to claim 16.
- 30. An immunogenic composition comprising a vaccine vector according to claim 17.
- 31. A method for inducing an immune response against <u>Chlamydia</u>, comprising administering to a host an effective amount of an immunogenic composition according to claim 23.
- 32. A method for inducing an immune response against <u>Chlamydia</u>, comprising administering to a host an effective amount of an immunogenic composition according to claim 24.
- 33. A method for inducing an immune response against <u>Chlamydia</u>, comprising administering to a host an effective amount of an immunogenic composition according to claim 25.
- 34. A method for inducing an immune response against <u>Chlamydia</u>, comprising administering to a host an effective amount of an immunogenic composition according to claim 26.
- 35. A method for inducing an immune response against <u>Chlamydia</u>, comprising administering to a host an effective amount of an immunogenic composition according to claim 27.
- 36. A method for inducing an immune response against <u>Chlamydia</u>, comprising administering to a host an effective amount of an immunogenic composition according to claim 28.
- 37. A method for inducing an immune response against <u>Chlamydia</u>, comprising administering to a host an effective amount of an immunogenic composition according to claim 29.
- 38. A method for inducing an immune response against <u>Chlamydia</u>, comprising administering to a host an effective amount of an immunogenic composition according to claim 30.

L8: Entry 42 of 99 File: USPT Aug 29, 2000

US-PAT-NO: 6110898

DOCUMENT-IDENTIFIER: US 6110898 A

TITLE: DNA vaccines for eliciting a mucosal immune response

DATE-ISSUED: August 29, 2000

### **INVENTOR-INFORMATION:**

NAME CITY STATE ZIP CODE COUNTRY

Malone; Robert W. Baltimore MD Malone; Jill G. Baltimore MD

US-CL-CURRENT: <u>514/44</u>; <u>424/204.1</u>, <u>424/234.1</u>, <u>424/256.1</u>, <u>424/93.1</u>, <u>435/455</u>, <u>435/6</u>, <u>435/69.1</u>, <u>435/91.1</u>

#### CLAIMS:

What is claimed is:

- 1. A method for inducing a mucosal immune response in a host comprising locally administering to said host an antigen-encoding polynucleotide preparation, whereby administration of said polynucleotide preparation is specifically targeted to mucosal inductor sites.
- 2. The method of claim 1, wherein said host is a mammal.
- 3. The method of claim 2, wherein said mammal is a human.
- 4. The method of claim 1, wherein said antigen-encoding polynucleotide preparation is a viral vector.
- 5. The method of claim 4, wherein said viral vector contains heterologous regions which encode for epitopic regions of at least one immunogenic protein.
- 6. The method of claim 5, wherein said immunogenic protein is encoded by a virus selected from the group consisting of <u>Human</u> Papalloma Virus, Herpes Simplex Virus, and <u>Human</u> Immunodeficiency Virus.
- 7. The method of claim 6, wherein said virus is Human Papalloma Virus.
- 8. The method of claim 5, wherein said immunogenic protein is the  $\underline{\text{Human}}$  Papilloma Virus major viral capsid protein L1.
- 9. The method of claim 6, wherein said virus is Herpes Simplex Virus.
- 10. The method of claim 5, wherein said immunogenic protein is the Herpes Simplex Virus immediate early protein ICP 27.
- 11. The method of claim 6, wherein said virus is Human Immunodeficiency Virus.

- 12. The method of claim 5, wherein said immunogenic protein is the all or part of the <u>Human</u> Immunodefieiency Virus envelope, gag, nef, or tat proteins.
- 13. The method of claim 5, wherein said viral vector includes a recombinant alphavirus vector system.
- 14. The method of claim 1, wherein said antigen-encoding polynucleotide preparation is derived from a prokaryote.
- 15. The method of claim 14, wherein said prokaryote contains heterologous genetic regions which encode for epitopic regions of at least one immunogenic protein.
- 16. The method of claim 14, wherein said prokaryote is selected from the group consisting of Helicobacter Pylorii and <a href="Chlamydia">Chlamydia</a> trachomatis.
- 17. The method of claim 15, wherein said immunogenic protein is all or part of the Helicobacter Pylorii urease protein.
- 18. The method of claim 15, wherin said immunogenic protein is all or part of the <a href="Chlamydia">Chlamydia</a> trachomatis major outer <a href="membrane protein">membrane protein</a>.
- 19. The method of claim 1, wherein said mucosal inductor sites are selected from the group consisting of Waldeyer's ring, Peyer's patches, gut-associated lymphoid tissues, bronchial associated lymphoid tissues, nasal-associated lymphoid tissues, genital-associated lymphoid tissues, and tonsils.
- 20. A method for polynucleotide delivery to the mucosal tissue of a host comprising locally administering to said host an antigen-encoding polynucleotide preparation, whereby administration of said polynucleotide preparation is specifically targeted to mucosal inductor sites.
- 21. The method of claim 20, wherein said host is a mammal.
- 22. The method of claim 21, wherein said mammal is a human.
- 23. The method of claim 20, wherein said antigen-encoding polynucleotide preparation is a viral vector.
- 24. The method of claim 23, wherein said viral vector contains heterologous regions which encode for epitopic regions of at least one immunogenic protein.
- 25. The method of claim 24, wherein said immunogenic protein is encoded by a virus selected from the group consisting of <u>Human</u> Papalloma Virus, Herpes Simplex Virus, and <u>Human</u> Immunodeficiency Virus.
- 26. The method of claim 25, wherein said virus is Human Papalloma Virus.
- 27. The method of claim 24, wherein said immunogenic protein is the <u>Human</u> Papilloma Virus major viral capsid protein L1.
- 28. The method of claim 25, wherein said virus is Herpes Simplex Virus.
- 29. The method of claim 24, wherein said immunogenic protein is the Herpes

Simplex Virus immediate early protein ICP 27.

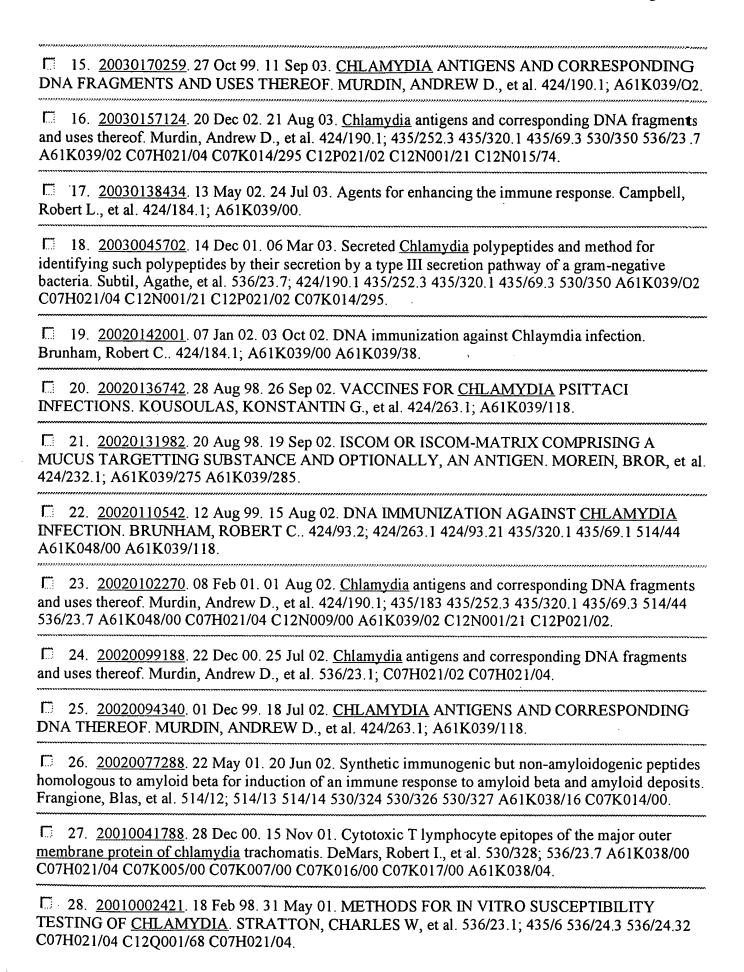
- 30. The method of claim 25, wherein said virus is  $\underline{\text{Human}}$  Immunodeficiency Virus.
- 31. The method of claim 24, wherein said immunogenic protein is the all or part of the Human Immunodefieiency Virus envelope, gag, nef, or tat proteins.
- 32. The method of claim 1, wherein said antigen-encoding polynucleotide preparation is derived from a prokaryote.
- 33. The method of claim 32, wherein said prokaryote contains heterologous genetic regions which encode for epitopic regions of at least one immunogenic protein.
- 34. The method of claim 32, wherein said prokaryote is selected from the group consisting of Helicobacter Pylorii and <a href="Chlamydia">Chlamydia</a> trachomatis.
- 35. The method of claim 33, wherein said immunogenic protein is all or part of the Helicobacter Pylorii urease protein.
- 37. The method of claim 23, wherein said viral vector includes a recombinant alphavirus vector system.
- 38. The method of claim 20, wherein said mucosal inductor sites are selected from the group consisting of Waldeyer's ring, Peyer's patches, gut-associated lymphoid tissues, bronchial associated lymphoid tissues, nasal-associated lymphoid tissues, genital-associated lymphoid tissues, and tonsils.

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eucaryote or eucaryotic or cho or human or fibroblast).ti,ab,clm.

L5: Entry 6 of 7 File: USPT Mar 29, 2005

US-PAT-NO: 6872814

DOCUMENT-IDENTIFIER: US 6872814 B2

TITLE: Chlamydia antigens and corresponding DNA fragments and uses thereof

DATE-ISSUED: March 29, 2005

INVENTOR-INFORMATION:

NAME. CITY STATE ZIP CODE COUNTRY Murdin / Andrew D. Ontario CA Oomen; Raymond P. Ontario CA Dunn; Pamela L. Ontario CA

US-CL-CURRENT: <u>536/23.7</u>; <u>424/184.1</u>, <u>424/234.1</u>, <u>424/263.1</u>, <u>435/252.3</u>, 435/320.1, <u>435/69.3</u>, <u>435/71.1</u>, <u>435/71.2</u>, <u>536/23.1</u>, <u>536/23.4</u>

#### CLAIMS:

What is claimed is:

- 1. An isolated polynucleotide from a strain of Chlamydia selected from the group consisting of: (a) a polynucleotide comprising the nucleotide sequence of SEQ ID NO:1; and (b) a polynucleotide which hybridizes under stringent hybridizing conditions of 6.times.SSC containing 50% formamide at 42.degree. C. with the polynucleotide comprising the nucleotide sequence of SEQ ID No:1.
- 2. The polynucleotide of claim 1, linked to a second nucleotide sequence wherein the polynucleotide encodes a fusion polypeptide.
- 3. The polynucleotide of claim 2 wherein the fusion polypeptide is a heterologous signal peptide.
- 4. The polynucleotide of claim 2 wherein the polynucleotide encodes a polypeptide comprising the amino acid sequence of SEQ ID NO: 2.
- 5. An expression cassette, comprising the polynucleotide of claim 1 operably linked to a promoter.
- 6. An expression vector, comprising the expression cassette of claim 5.
- 7. An isolated host cell, comprising the expression cassette of claim 5.
- 8. The host cell of claim 7, wherein said host cell is a prokaryotic cell.
- 9. The host cell of claim 7, wherein said host cell is a eukaryotic cell.
- 10. A vaccine vector, comprising the expression cassette of claim 5.
- 11. The vaccine vector of claim 10, wherein said vector is in a pharmaceutically acceptable excipient.

- 12. A pharmaceutical composition, comprising an immunologically effective amount of the vaccine vector of claim 10.
- 13. The host cell of claim 9, wherein said <a href="eukaryotic">eukaryotic</a> cell is a <a href="mailto:ma cell.
- 14. The host cell of claim 13, wherein said mammalian cell is a human cell.
- 15. The vaccine vector of claim 10, wherein said vector is a viral live vaccine vector or a bacterial live vaccine vector.
- 16. The vaccine vector of claim 15, wherein said viral live vaccine vector is selected from the group consisting of: adenoviruses, alphavirus, and poxviruses.
- 17. The vaccine vector of claim 15, wherein said bacterial live vaccine vector is selected from the group consisting of: Shigella, Salmonella, Vibrzo cholerae, Lactobacillus, Bacille bilie de Calmette-Guerin, and Streptococcus.

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US-PAT-NO: 6872814

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ASSIGNEE-INFORMATION:

NAME CITY STATE ZIP CODE COUNTRY TYPE CODE

Aventis Pasteur Limited Toronto CA 03

APPL-NO: 09/ 428122 [PALM]
DATE FILED: October 27, 1999

#### PARENT-CASE:

RELATED U.S. APPLICATION The present patent application claims priority to the following United States provisional patent applications: U.S. Ser. Nos. 60/106,070, filed Oct. 29, 1998 and No. 60/122,066, filed Mar. 1, 1999, each incorporated herein by reference.

INT-CL: [07] C07H02104, C12N01500, C12N05909, A61K039118, A61K03902

US-CL-ISSUED: 536/23.7; 536/23.1, 536/23.4, 435/320.1, 435/252.3, 435/69.3, 435/71.1, 435/71.2, 424/263.1, 424/234.1, 424/184.1

US-CL-CURRENT: 536/23.7; 424/184.1, 424/234.1, 424/263.1, 435/252.3, 435/320.1, 435/69.3, 435/71.1, 435/71.2, 536/23.1, 536/23.4

FIELD-OF-SEARCH: 536/23.7, 536/23.4, 536/23.1, 536/24.3, 536/24.32, 424/184.1, 424/200.1, 424/263.1, 424/234.1, 424/320.1, 435/252.3, 435/71.1, 435/71.2, 435/69.3

PRIOR-ART-DISCLOSED:

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